

SEPA ENVIRONMENTAL CHECKLIST

Purpose of Checklist

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization, or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for Applicants

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use “not applicable” or “does not apply” only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of Checklist for Nonproject Proposals

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the [SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS \(part D\)](#). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. BACKGROUND

1. Name of project (*proposal*), if applicable.

Draft Aquatic Mosquito Control NPDES General Permit

2. Name of applicant (*proponent*).

Washington State Department of Ecology

3. Address and phone number of applicant (*proponent*) and contact person.

Contact: Stacey Callaway, General Permit Writer

Address: Washington State Department of Ecology

Water Quality Program

Attn: Stacey Callaway

PO Box 47600

Olympia, WA 98504

Phone: (360) 407-7118

Email: Stacey.Callaway@ecy.wa.gov

4. Date checklist prepared.

January 8, 2019. Submitted on February 7, 2019.

5. Agency requesting checklist.

Washington State Department of Ecology

6. Proposed timing or schedule (including phasing, if applicable).

Ecology will release the formal draft to the public on March 6, 2019. The public comment period for the SEPA determination will run concurrently with the public review of the draft general permit documents.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this project (*proposal*)? If yes, explain.

General permits are revised on a 5-year life cycle. The previous version of the Aquatic Mosquito Control NPDES General Permit was issued on May 20, 2015, and was set to expire on June 17, 2020. After receiving requests from permittees to add a new active ingredient, Ecology decided to reissue the permit early instead of conducting a major modification because the permit would expire soon and a major modification does not reset the 5-year life cycle. Ecology would have to reissue the permit shortly after adopting the major modifications, so Ecology chose to reissue the general permit rather than conduct a major modification.

The Aquatic Mosquito Control NPDES General Permit will expire 5 years after the date the permit is issued. Ecology intends to revise the Aquatic Mosquito Control NPDES General Permit at that time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this project (*proposal*).

The Fact Sheet for the Aquatic Mosquito Control NPDES General Permit was prepared for the Draft Aquatic Mosquito Control NPDES General Permit. Additionally, a SEPA Environmental Checklist was developed in 2015 for the reissuance of the Draft Aquatic Mosquito Control NPDES General Permit. These documents contain additional background and analysis, including additional references for documents reviewed during the development of the Aquatic Mosquito Control NPDES General Permit.

Ecology also assessed potential financial impacts and documented the assessment in the Economic Impact Analysis for the Aquatic Mosquito Control NPDES General Permit.

The following guidance documents are also available.

- Best Management Practices for Mosquito Control, available at the following link.
<https://fortress.wa.gov/ecy/publications/publications/0310023.pdf>
- Reasonable Potential Determination, available on request.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property (*geographic area*) covered by the project (*proposal*)? If yes, explain.

Ecology is unaware of pending applications or other proposals that may impact areas where aquatic mosquito control activities occur under coverage of this general permit.

10. List any government approvals or permits that will be needed for the project (*proposal*), if known.

Permittees must follow the EPA-approved FIFRA label. The FIFRA label provides limits on the application of the pesticide product. Permittees must also comply with the Washington Pesticide Control Act and the Washington Pesticide Application Act. Additionally, the Draft Aquatic Mosquito Control NPDES General Permit requires that chemicals be applied by licensed applicators that have obtained the appropriate pesticide applicators license from the Washington State Department of Agriculture.

Permittees must also ensure that the application of larvicides or adulticides does not cause harm to vulnerable (sensitive, threatened, or endangered) species populations, which is regulated under the endangered species regulations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” (vulnerable species areas). The document was created in 2002, revised in 2015, and can be found via the following link.

<https://ecology.wa.gov/DOE/files/3e/3e837bdb-10d0-4496-9b51-40a0f053f53f.pdf>

For vulnerable species areas that are within the permittee's jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern and submit the plan for review and approval by Ecology. The plan must include letters of concurrence from the WDFW and the affected land management agency, if one exists.

- 11. Give brief, complete description of your project (*proposal*), including the proposed uses and the size of the site (*geographic area*). There are several questions later in this checklist that ask you to describe certain aspects of the project (*proposal*). You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on proposal description.)**

This SEPA Environmental Checklist was prepared for the non-project proposal of the issuance of the Draft Aquatic Mosquito Control NPDES General Permit.

The Draft Aquatic Mosquito Control NPDES General Permit covers all mosquito control activities that result in a discharge of larvicides or indirect discharge of adulticides to Waters of Washington State. This permit does **not** apply to homeowner use of residential pesticides.

- 12. Location of the project (*proposal*). Give sufficient information for a person to understand the precise location of the project (*proposal*), including a street address, if any, and section, township, and range, if known. If a project (*proposal*) would occur over a range of area, provide the range or boundaries of the site(s) (*geographic area*). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State.

This permit does **not** apply to:

1. Federal lands in Washington where a federal agency made the decision to apply or is the entity applying larvicides or adulticides.
2. Indian Country and trust or restricted lands except portions of the Puyallup Reservation as noted. Puyallup Exception: Following the Puyallup Tribe of Indians Land Claims Settlement Act of 1989, 25 U.S.C. §1773; this permit does apply to land within the Puyallup Reservation except for discharges to surface water on land held in trust by the federal government.

B. ENVIRONMENTAL ELEMENTS

This SEPA Environmental Checklist was prepared for a non-project proposal of the development and issuance of the Draft Aquatic Mosquito Control NPDES General Permit. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of the State throughout Washington State. Discharges covered by the general permit will vary depending on the location of the location of the treatment and the permittee's mosquito control practices. Permittees must develop a SEPA checklist that is specific to their project. Project-level SEPA checklists will identify potential impacts that may result from the application of insecticides to control mosquitoes.

1. Earth

- a. **General description of the site (*geographic area*) (circle one): Flat, rolling, hilly, steep slopes, mountainous, other.**

Variable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the site topography will depend on the location of the treatment.

- b. **What is the steepest slope on the site (*geographic area*) (approximate percent slope)?**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the site topography, including the steepest slope on the site, will depend on the location of the treatment.

- c. **What general types of soils are found on the site (*geographic area*) (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.**

Variable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the soil type at the site will depend on the location of the treatment.

- d. **Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the soil stability of the site will depend on the location of the treatment.

- e. **Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.**

No filling or grading activities are proposed for the reissuance of the Draft Aquatic Mosquito Control NPDES General Permit.

- f. **Could erosion occur as a result of clearing, construction, or use? If so, generally describe.**

No clearing or construction activities are proposed for the reissuance of the Draft Aquatic Mosquito Control NPDES General Permit.

- g. About what percent of the site (*geographic area*) will be covered with impervious surfaces after project construction (*proposal development*) (for example, asphalt or buildings)?**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The percentage of impervious surface at the treatment site will depend on the location of the treatment. No construction is proposed or required by the permit.

- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.**

The Draft Aquatic Mosquito Control NPDES General Permit covers discharges of larvicides and adulticides to Waters of Washington State to control mosquitoes, throughout Washington State. Measures to reduce or control erosion are not addressed in the draft general permit.

2. Air

- a. What types of emissions to the air would result from the project (*proposal*) (i.e., dust, automobile, odors, and industrial wood smoke) during construction and when the project (*proposal*) is completed? If any, generally describe and give approximate quantities if known.**

Some discharges that may occur under the Draft Aquatic Mosquito Control NPDES General Permit would create ultra-low volume aerosols of the adulticide used during application. The duration of the impact from the aerosols would be temporary and short lived since they would not last much longer than the pesticide application process.

- b. Are there any off-site sources of emissions or odor that may affect the project (*proposal*)? If so, generally describe.**

The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, offsite sources of emissions or odors will depend on the location of the treatment. Off-site sources of odor are not expected to impact the proposal.

- c. Proposed measures to reduce or control emissions or other impacts to air, if any.**

The FIFRA labels for most adulticides require that applications only occur when wind speeds are 10 mph or less. However, the FIFRA label for deltamethrin recommends applying the chemical when wind speeds are equal to or greater than 1 mph. Additionally, application of adulticides is performed during periods of time when adult mosquitoes are most active, typically after sunset and before sunrise. This limits the time and duration that adulticides can be effectively applied.

3. Water

a. Surface Water

- i. **Is there any surface water body on or in the immediate vicinity of the site (*geographic area*) (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.**

Yes. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. And mosquito control generally takes place in and around water bodies throughout the state.

- ii. **Will the project (*proposal*) require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.**

Yes. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. And mosquito control generally takes place in and around water bodies throughout the state. The draft general permit is the plan for controlling where and how larvicides and adulticides are applied so that they are effective and so that impacts to non-target species are reduced.

- iii. **Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site (*geographic area*) that would be affected. Indicate the source of fill material.**

None. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The general permit does not regulate the placement or removal of fill and dredge material.

- iv. **Will the project (*proposal*) require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.**

No. The Draft Aquatic Mosquito Control NPDES General Permit does not address permittees withdrawing or diverting surface water.

- v. **Does the project (*proposal*) lie within a 100-year floodplain? If so, note location on the site plan.**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the possibility of an application occurring within a 100-year floodplain will vary depending on the location of the treatment area.

- vi. **Does the project (*proposal*) involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

Yes. The Draft Aquatic Mosquito Control NPDES General Permit specifically conditions the discharge of potential pollutants that occur as a result of mosquito control activities. The chemicals proposed for discharge can be found in the non-project portion of this checklist. The volume of the discharge will be project and product dependent and will follow use rate restrictions on the FIFRA label for the product being used for mosquito control.

b. Ground Water

- i. Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.**

No. The Draft Aquatic Mosquito Control NPDES General Permit does not address permittees withdrawing or diverting surface water.

- ii. Describe waste material that will be discharged to the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not cover discharges to the ground from septic systems.

c. Water runoff (including stormwater)

- i. Describe the source of runoff (including stormwater) and the method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not cover the collection or disposal of runoff.

- ii. Could waste materials enter ground or surface waters? If so, generally describe.**

Yes. The Draft Aquatic Mosquito Control NPDES General Permit specifically conditions the discharge of potential pollutants that would occur as a result of mosquito control activities. The chemicals proposed for discharge can be found in the non-project portion of this checklist. The volume of the discharge will be project dependent and will follow use rate restrictions on the FIFRA label for the product being used for mosquito control.

- iii. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any.**

The Draft Aquatic Mosquito Control NPDES General Permit requires permittees to:

- Comply with the EPA-approved FIFRA label. The FIFRA label provides limits on the amount of pesticide that can be applied at any one time, which will limit the amount of pesticide available to runoff with stormwater.
- Comply with the Washington Pesticide Control Act (Chapter 15.58 RCW) and the Washington Pesticide Application Act (Chapter 17.21 RCW).
- Work with a licensed applicator. The general permit requires that chemicals be applied by licensed applicators that have obtained the appropriate pesticide applicators license from the Washington State Department of Agriculture.
- Use ultra-low volume (ULV) application equipment to apply adulticides if available. Additionally, applications of adulticides may only indirectly enter the water and not be applied directly to water.
- Post notices at all reasonable points of public access to the treatment areas when applying larvicides with water-use restrictions to water bodies used for water supply, fish and shellfish harvesting, swimming, or other water contact activities.

- Publish a public notice on their webpage or in a newspaper with general circulation within the area where larvicide or adulticide application will take place at least ten (10) days before the first pesticide application of the season.
- Complete an Integrated Pest Management (IPM) plan that describes strategies and mechanisms to control the discharge of adulticides.

4. Plants

a. Check or circle types of vegetation found on the site (*geographic area*).

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the type of vegetation found at each permitted treatment site will vary. It is possible that a variety of vegetation could grow on or near permitted treatment sites. Because the products are insecticides, they are not expected to have non-target impacts on plants.

- _____ deciduous tree: alder, maple, aspen, other
- _____ evergreen tree: fir, cedar, pine, other
- _____ shrubs
- _____ grass
- _____ pasture
- _____ crop or grain
- _____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- _____ water plants: water lily, eelgrass, milfoil, other
- _____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The permit does not regulate vegetation removal or alteration.

c. List threatened or endangered species known to be on or near the site (*geographic area*).

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the occurrence, type, and quantity of threatened or endangered species at each permitted treatment site will vary. For more information, visit the Washington State Department of Fish and Wildlife's map of priority habitats and species at the following link.

[\(https://wdfw.wa.gov/mapping/phs/\)](https://wdfw.wa.gov/mapping/phs/)

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site (*geographic area*), if any.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The permit does not regulate the preservation or enhancement of vegetation in the treatment areas.

5. Animals

- a. Circle any birds and animals which have been observed on or near the site (*geographic area*) or are known to be on or near the site (*geographic area*).**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the occurrence, amount, and type of animals observed at each treatment area will vary.

Permittees must ensure that the application of larvicides or adulticides does not cause harm to vulnerable (sensitive, threatened, or endangered) species populations, which is regulated under the endangered species regulations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species”. The document was created in 2002, revised in 2015, and can be found via the following link.

<https://ecology.wa.gov/DOE/files/3e/3e837bdb-10d0-4496-9b51-40a0f053f53f.pdf>

For those areas identified in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” that are within the permittee’s jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern and submit the plan for review and approval by Ecology. The plan must include letters of concurrence from the WDFW and the affected land management agency, if one exists.

- b. List any threatened or endangered species known to be on or near the site (*geographic area*).**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the occurrence, amount, and type of threatened or endangered species observed at each permitted treatment site will vary.

Permittees must ensure that the application of larvicides or adulticides does not cause harm to vulnerable (sensitive, threatened, or endangered) species populations, which is regulated under the endangered species regulations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species”. The document was created in 2002, revised in 2015, and can be found via the following link.

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For those areas identified in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” that are within the permittee’s jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern and submit the plan for review and approval by Ecology. The plan must include letters of concurrence from the WDFW and the affected land management agency, if one exists.

- c. Is the site (*geographic area*) part of a migration route? If so, explain.**

The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the likelihood that a treatment area is located along a migration route will vary. However, numerous bird species migrate across

Washington State via the Pacific Flyway, a major north-south flyway for migratory birds in America.

Permittees must ensure that the application of larvicides or adulticides does not cause harm to vulnerable (sensitive, threatened, or endangered) species populations, which is regulated under the endangered species regulations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species”. The document was created in 2002, revised in 2015, and can be found via the following link.

<https://ecology.wa.gov/DOE/files/3e/3e837bdb-10d0-4496-9b51-40a0f053f53f.pdf>

For those areas identified in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” that are within the permittee’s jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern and submit the plan for review and approval by Ecology. The plan must include letters of concurrence from the WDFW and the affected land management agency, if one exists.

d. Proposed measures to preserve or enhance wildlife, if any.

The Draft Aquatic Mosquito Control NPDES General Permit does not include measures that specifically preserve or enhance wildlife.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's (*proposal's*) energy needs? Describe whether it will be used for heating, manufacturing, etc.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Activities covered by this general permit do not result in the development of permanent infrastructure. Pesticide applications are intermittent and conducted by airplane, boat, motor vehicle, and backpack sprayer.

b. Would the project (*proposal*) affect the potential use of solar energy by adjacent properties? If so, generally describe.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The permit does not address the potential use of solar energy.

c. What kinds of energy conservation features are included in the plans of this project (*proposal*)? List other proposed measures to reduce or control energy impacts, if any.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The permit does not address the energy conservation features.

7. Environmental health

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this project (*proposal*)? If so, describe.**

See the discussion in the non-project portion of this checklist.

- i. Describe special emergency services that might be required.**

Unknown. The use of emergency services will vary depending on how each permittee handles mosquito control. The product FIFRA labels and OSHA safety requirements address how a person should respond to pesticide exposure that may require emergency services.

- ii. Proposed measures to reduce or control environmental health hazards, if any.**

The Draft Aquatic Mosquito Control NPDES General Permit requires permittees to:

- Comply with the EPA-approved FIFRA label. The FIFRA label provides limits on the application of the pesticide product.
- Comply with the Washington Pesticide Control Act and the Washington Pesticide Application Act.
- Work with a licensed applicator. The general permit requires that chemicals be applied by licensed applicators.
- Post notices at all reasonable points of public access to the treatment areas when applying larvicides with water-use restrictions to water bodies used for water supply, fish and shellfish harvesting, swimming, or other water contact activities.
- Publish a public notice on their webpage or in a newspaper with general circulation within the area where larvicide or adulticide application will take place at least ten (10) days before the first pesticide application of the season.
- Complete an Integrated Pest Management (IPM) plan that describes strategies and mechanisms to control the discharge of adulticides.

b. Noise

- i. What types of noise exists in the area which may affect the project (*proposal*) (for example: traffic, equipment, operation, other)?**

Not applicable. Noise should not affect applications of larvicides or adulticides.

- ii. What types and levels of noise would be created by or associated with the project (*proposal*) on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site (*geographic area*).**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The types and levels of noise created by the activities covered by the general permit will depend on the application method, but should be infrequent and not last long. For instance, applications may be made via aircraft, boat, vehicle, or backpack sprayer.

iii. Proposed measures to reduce or control noise impacts, if any:

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The permit does not address the reduction or control of noise.

8. Land and shoreline use

a. What is the current use of the geographic area?

Variable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the current use of the site will vary depending on the location of the treatment area.

b. Has the site (*geographic area*) been used for agriculture? If so, describe.

Unknown, but many locations may have been used for agriculture. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the agricultural use of the site will vary depending on the location of the treatment area.

c. Describe any structures on the site (*geographic area*).

Variable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, structures will vary depending on the location of the treatment area.

d. Will any structures be demolished? If so, what?

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. The draft general permit does not regulate the construction or demolition of structures.

e. What is the current zoning classification of the site (*geographic area*)?

Variable. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the zoning classification for each treatment area will depend on the location of the treatment area. However, the general permit does not cover homeowner use of pesticides for residential control of mosquitoes.

f. What is the current comprehensive plan designation of the site (*geographic area*)?

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the comprehensive plan designation for each treatment area will depend on the location of the treatment area.

g. If applicable, what is the current shoreline master program designation of the site (*geographic area*)?

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, the shoreline master program designation for each treatment area will depend on the location of the treatment area.

h. Has any part of the site (*geographic area*) been classified as an "environmentally sensitive" area? If so, specify.

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Therefore, it is unknown if a treatment will occur in an area that has been, or will be, classified as an environmentally sensitive area. For more information, visit the Washington State Department of Fish and Wildlife's map of priority habitats and species at the following link.

[\(https://wdfw.wa.gov/mapping/phs/\)](https://wdfw.wa.gov/mapping/phs/)

Additionally, permittees must comply with local (city and county) ordinances that regulate the use of pesticides.

i. Approximately how many people would reside or work in the completed project (*proposal*)?

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Access to treatment areas may be temporarily restricted until the applied pesticide dries.

j. Approximately how many people would the completed project (*proposal*) displace?

None. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of Washington State, throughout Washington State. Access to treatment areas may be temporarily restricted until the applied pesticide dries.

k. Proposed measures to avoid or reduce displacement impacts, if any.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce displacement impacts. Temporarily restricting access to treatment areas protects humans from potential exposure to mosquito control chemicals.

l. Proposed measures to ensure the project (*proposal*) is compatible with existing and projected land uses and plans, if any.

The permittee must ensure that application of larvicides or adulticides does not cause harm to vulnerable (sensitive, threatened, or endangered) species populations, which is regulated under the endangered species regulations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled "Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species". The document was created in 2002, revised in 2015, and can be found via the following link.

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For those areas identified in "Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species" that are within the permittee's jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern and submit the plan for review and approval by Ecology. The plan must include letters of concurrence from the WDFW and the affected land management agency, if one exists.

Additionally, permittees must comply with local (city and county) ordinances that regulate the use of pesticides.

9. Housing

- a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not regulate the addition or removal of housing units.

- b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not regulate the elimination of housing units.

- c. Proposed measures to reduce or control housing impacts, if any.**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not regulate the creation or elimination of housing units.

10. Aesthetics

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not address the construction of structures.

- b. What views in the immediate vicinity would be altered or obstructed?**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not address the construction of structures. Therefore, the views in the immediate vicinity of a treatment area should not be impacted.

- c. Proposed measures to reduce or control aesthetic impacts, if any.**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not address aesthetics.

11. Light and glare

- a. What type of light or glare will the project (*proposal*) produce? What time of day would it mainly occur?**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not address light or glare.

- b. Could light or glare from the finished project (*proposal*) be a safety hazard or interfere with views?**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not address light or glare.

c. What existing off-site sources of light or glare may affect your project (*proposal*)?

None.

d. Proposed measures to reduce or control light and glare impacts, if any.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce or control light and glare.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Variable. The Draft Aquatic Mosquito Control NPDES General Permit may temporarily restrict access to treatment sites. Temporarily restricting access to treatment areas protects humans from potential exposure to mosquito control chemicals. However, because the Draft Mosquito Control NPDES General Permit controls discharges to Waters of the State throughout Washington State, it is unknown where treatments will occur. Therefore, it is unknown what designated and informal recreational opportunities are in the immediate vicinity of future treatments.

b. Would the proposed project (*proposal*) displace any existing recreational uses? If so, describe.

No. The Draft Aquatic Mosquito Control NPDES General Permit may temporarily restrict access to treatment sites. Temporarily restricting access to treatment areas protects humans from potential exposure to mosquito control chemicals. However, because the Draft Mosquito Control NPDES General Permit controls discharges to Waters of the State throughout Washington State, it is unknown where treatments will occur. Therefore, it is unknown if any existing recreational uses are in the immediate vicinity of future treatments.

Discussions with permittees during previous permit development cycles indicated that, even though applying chemicals to control mosquito populations may cause a short-term impact to recreation, the overall recreational opportunity is enhanced because of a reduction in mosquito populations.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project (*proposal*) or applicant (*proponent*), if any.

The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce or control impacts to recreation. However, the mosquito control activities authorized under this general permit may enhance recreational opportunities through the removal of nuisance mosquito populations that may cause the public to avoid outdoor recreation in areas with high mosquito populations.

13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site (*geographic area*)? If so, generally describe.

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of the State, throughout Washington State. Therefore, the possibility of any place or

object listed on a preservation register being on or near a treatment site will depend on the location of future treatments.

- b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site (*geographic area*).**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of the State, throughout Washington State. Therefore, the possibility of any place or object listed on a preservation register being on or near a treatment site will depend on the location of future treatments.

- c. Proposed measures to reduce or control impacts, if any.**

The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce or control impacts to historic or cultural preservation.

14. Transportation

- a. Identify public streets and highways serving the site (*geographic area*), and describe proposed access to the existing street system. Show on site plans, if any.**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of the State, throughout Washington State. Therefore, streets and highways serving a site will vary depending on the location of future treatments covered under the Draft Aquatic Mosquito Control NPDES General Permit.

- b. Is the site (*geographic area*) currently served by public transit? If not, what is the approximate distance to the nearest transit stop?**

Unknown. The Draft Aquatic Mosquito Control NPDES General Permit covers discharges to Waters of the State, throughout Washington State. Therefore, the location of public transit will vary depending on the location of future treatments covered under the Draft Aquatic Mosquito Control NPDES General Permit.

- c. How many parking spaces would the completed project (*proposal*) have? How many would the project (*proposal*) eliminate?**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not regulate the creation or removal of parking spaces.

- d. Will the project (*proposal*) require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).**

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not regulate the creation of roads or streets.

- e. Will the project (*proposal*) use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

Yes. The Draft Aquatic Mosquito Control NPDES General Permit covers applications of chemicals made via aircraft, boat, backpack sprayer, and vehicle. Because the general permit covers discharges to Waters of the State throughout Washington State, the use of, or location near, water, rail, or air transportation, varies depending on the location of the treatment.

f. How many vehicular trips per day would be generated by the completed project (*proposal*)? If known, indicate when peak volumes would occur.

It is unknown if the Draft Aquatic Mosquito Control NPDES General Permit will cause an increase or decrease in the number of vehicle trips per day. However, any extra traffic generated would likely occur at times when traffic volumes are already low (for example, late evening, night, and early morning).

g. Proposed measures to reduce or control transportation impacts, if any.

The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce or control transportation impacts.

15. Public services

a. Would the project (*proposal*) result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

It is unlikely that the Draft Aquatic Mosquito Control NPDES General Permit will increase the need for public services. However, it is likely that the general permit reduces the need for public services by reducing mosquito populations that act as vectors for diseases such as the West Nile Virus, which can impact human health and livestock.

b. Proposed measures to reduce or control direct impacts on public services, if any.

The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce or control impacts to public services.

16. Utilities

a. Circle utilities currently available at the site (*geographic area*): electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

Unknown. If present at all, the types of utilities near a permitted treatment site will vary depending on the location of that treatment site. The proposal does not depend on existing utilities.

b. Describe the utilities that are proposed for the project (*proposal*), the utility providing the service, and the general construction activities on the site (*geographic area*) or in the immediate vicinity which might be needed.

Not applicable. The Draft Aquatic Mosquito Control NPDES General Permit does not regulate utilities.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature:  _____

Name of signee: Vincent McGowan, P.E.

Position and agency: Program Development Services Section Manager
Water Quality Program
Washington State Department of Ecology

Date submitted: February 7, 2019

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(IT IS NOT NECESSARY to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1a. How would the project (*proposal*) likely increase discharges to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The Draft Aquatic Mosquito Control NPDES General Permit could result in either direct or incidental (indirect) discharges of insecticides to Waters of the State. The larvicides and adulticides proposed for inclusion in the draft general permit include:

- Bacillus sphaericus (H-5a5b)
- Bacillus thuringiensis israelensis (Bti)
- Deltamethrin
- Etofenprox
- Malathion
- Methoprene
- Monomolecular Surface Films (MSF)
- Naled
- Natural Pyrethrins
- Paraffinic White Mineral Oil (larvicidal oils)
- Permethrin
- Piperonyl Butoxide (PBO)
- Prallethrin
- Resmethrin
- Spinosad
- Sumithrin (d-phenothrin)
- Temephos

To estimate the potential for adulticides to indirectly enter Waters of the State, Ecology developed a Reasonable Potential Determination document, which is available on request to Ecology.

The Draft Aquatic Mosquito Control NPDES General Permit has the potential to temporarily increase:

- Exhaust emissions to the air through the application of the chemicals—listed above—via aircraft, boat, or vehicle.
- Pesticide discharge to the air through application of the chemicals—listed above—via aircraft, boat, backpack sprayer, or vehicle.

- Production of noise through the application of the chemicals—listed above—via aircraft, boat, or vehicle. Terrestrial application of adulticides typically occur at dawn and dusk when mosquitoes are most active.

For additional information, see the Fact Sheet on Ecology’s webpage at the following link.

<https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Aquatic-pesticide-permits/Aquatic-mosquito-control>

1b. Proposed measures to avoid or reduce such increases include the following.

Permittees must follow the EPA-approved FIFRA label. The FIFRA label provides limits on the application of the pesticide product. Permittees must also comply with the Washington Pesticide Control Act and the Washington Pesticide Application Act. Additionally, the Draft Aquatic Mosquito Control NPDES General Permit requires that chemicals be applied by licensed applicators.

Permittees who plan to use adulticides to control mosquito populations must complete an Integrated Pest Management (IPM) plan that describes strategies and mechanisms to control the discharge of adulticides.

Permittees who only apply larvicides may use the Ecology publication titled “Best Management Practices for Mosquito Control, May 2004” (Publication # 03-10-023), or an equivalent, instead of developing their own IPM plan. If the permittee later decides to include adulticides in their mosquito control operations, they must develop an IPM plan prior to using adulticides.

2a. How would the project (*proposal*) likely affect plants, animals, fish, or marine life?

Discharges covered by the Draft Aquatic Mosquito Control NPDES General Permit are intended to control mosquitoes and are unlikely to impact plants. Discharges to marine waters may occur through incidental overspray of adulticides or through the treatment of estuarine water with larvicides.

Mosquito control treatments occur intermittently and the chemicals used to treat mosquitoes are applied at ultra-low volumes. Due to the nature of treatments to control mosquitoes, it is unlikely that chronic exposure to mosquito control chemicals will occur. However, examples of potential effects of chronic exposure are provided for each chemical discussed below, for both larvicides and adulticides.

A general overview of the chemicals proposed for inclusion in the Draft Aquatic Mosquito Control NPDES General Permit, both larvicides and adulticides, is included below as well as the potential impacts to animals and aquatic life.

LARVICIDES

The Draft Aquatic Mosquito Control NPDES General Permit authorizes the discharge of several larvicidal active ingredients for permittees to control mosquitoes. The active ingredients included for use in the draft general permit include the following. Information about these larvicides is included below as well as in the Fact Sheet for the Draft Aquatic Mosquito Control NPDES General Permit, on Ecology’s webpage at the following link.

<https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Aquatic-pesticide-permits/Aquatic-mosquito-control>

- *Bacillus sphaericus* (H-5a5b)
- *Bacillus thuringiensis israelensis* (Bti)

- Larvicidal oils
- Malathion
- Methoprene
- Monomolecular surface films
- Spinosad
- Temephos

Bacillus Sphaericus (B. sphaericus)

Bacillus sphaericus is a naturally occurring (where it does occur), spore-forming bacterium, which produces a protein endotoxin at the time of sporulation. The toxin is only active against the larval stage and must be ingested and digested before it activates. *B. sphaericus* is uniquely able to control mosquito larvae in highly organic aquatic environments such as manure waste lagoons and stormwater catch basins.

B. sphaericus can offer up to six weeks of control in many habitats because the protoxins and spores can remain suspended in the water column for extended periods of time and because of the recycling of bacteria in dead larvae. The duration of control will depend on habitat factors such as water depth, flushing, water chemistry and the frequency of oviposition to maintain the recycling process. Vectolex, the trade name for *B. sphaericus*, is available in corn cob granule, water dispersible granule, and water dispersible pouch formulations.

B. sphaericus was first registered for the control of *Culex* mosquitoes but its uses have been expanded to include control of several *Aedes*, *Anopheles*, *Ochlerotatus*, *Psorophora* and *Coquilettidia* species. *B. sphaericus* is not acutely toxic to freshwater and saltwater invertebrates, honeybees, and mayfly larvae. *B. sphaericus* does not appear to be harmful to fish and other marine life, and it is not toxic to birds on a sub-chronic basis. In tests, *B. sphaericus* was not pathogenic, infective, or toxic in laboratory animals by the oral, dermal, pulmonary, and intravenous routes of exposure. In humans, mild skin and eye irritation can occur with direct contact.

Bacillus Thuringiensis Israelensis (Bti)

Bacillus thuringiensis, subspecies *israelensis* (*Bti*) is a naturally occurring soil bacterium that can effectively kill mosquitoes during the larval stage of development. *Bti* is an endospore-forming bacterium that is ingested by the actively feeding larvae. When the bacteria *Bti* encysts, it produces a protein crystal toxic to mosquito larvae. Once the bacteria have been ingested, the toxin disrupts the lining of the larvae's intestine causing it to stop eating and die.

Bti is the primary material used for mosquito control because of its low toxicity to non-target species. *Bti* is highly effective against the first through third larval instars of mosquitoes (family Culicidae), blackflies (Family Simuliidae) and has some virulence against certain other Dipteran Families, especially midges (Family Chironomidae). *Bti* has been extensively studied for effects on non-target organisms and environmental consequences of use with no reported adverse effects. It is not toxic to bees. According to several studies, when applied at field application rates, *Bti* has no reported effect on fish and amphibians. Studies have also found no effect on warm-blooded mammals. Labels indicate that direct contact with the products may cause mild eye or skin irritation.

Bti products are available in liquid, pellet, granular, and briquette formulations. The type of *Bti* formulation influences the activity of the product. Generally, *Bti* does not persist long after application, with toxicity persisting from 24 hours to over one month when the longer lasting formulations are used.

Larval toxicity can depend on the species, its feeding activity and other possible factors such as UV light, water quality, pH, temperature, agitation, and sedimentation. Commercially-available Bti strains are sold under several names, including Aquabac, Bactimos, Bonide Mosquito Beater “Plunks”, Healthy Ponds, Sentry, Summit Bti Briquettes, Teknar and Vectobac. A number of Bti products are available for residential use in water bodies, such as lined ornamental ponds, and are sold under various trade names such as Bayer Advanced Garden Mosquito Preventer, Beckett Skeeter Stopper, Mosquito Depth Charges, Mosquito Dunks, Mosquito Bits Quick-Kill, and Spectracide Mosquito Stop.

Larvicidal Oils

Larvicidal oils, like paraffinic white mineral oil, are used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes. Oils are petroleum or mineral based and are typically used as a product of last resort for the control of mosquito pupae, since this stage does not feed, but does require oxygen.

Oils can persist for 12 to 15 hours and then evaporate within a few days. Larvicidal oils, if misapplied, can be toxic to fish and other aquatic organisms. Studies have shown that aquatic invertebrates, amphibians, waterfowl, furbearers, and fish may be negatively affected. The Draft Aquatic Mosquito Control NPDES General Permit requires consultation and agreement of the WDFW prior to using these products in areas where vulnerable (sensitive, threatened or endangered) species are present.

Malathion

Malathion is a broad spectrum organophosphate insecticide. It is used in agriculture, residential, pharmaceutical, and public health programs across the country to control a large number of pests.

Relatively resistant to UL degradation (photolysis), malathion is susceptible to hydrolysis in alkaline conditions. In neutral to alkaline conditions, the half-life of malathion is 1 to 2 weeks and in acidic conditions, the half-life is 107 days. Information included in the EPA revised Reregistration Eligibility Decision (RED) for Malathion indicates that malaoxon (malathion primary metabolite) can remain stable for at least 72 hours, which is long enough to reach domestic drinking water supplies in some areas.

The half-life in soil is 1 to 25 days, depending on microbial activity, with higher activity resulting in a shorter half-life. Malathion does not adsorb to soils very well so it is somewhat mobile in the soil, and has the potential to leach to groundwater.

Like other organophosphates, it works by disrupting the central nervous system through cholinesterase inhibition. Its primary metabolite—malaoxon—is also a cholinesterase inhibitor. Carboxyesterase activity in the body works to reduce the effects of malathion and malaoxon accumulation. Carboxyesterase are more active in mammals than insects, which can explain the higher toxicity in insects.

Malathion has a low toxicity to mammals. However, during inhalation tests, some respiratory lesions and a decrease in cholinesterase activity, are present at high doses of malathion. Life threatening exposure can cause respiratory distress, diarrhea, tremors, confusion, seizures, and coma.

Malathion is highly toxic to beneficial insects and aquatic organisms (both vertebrates and invertebrates) during acute and chronic testing. Acute toxicity is not expected in reptiles as they have detoxification efficiency similar to mammals.

The National Marine Fisheries Service (NMFS) completed a biological opinion on the effects of the EPA’s malathion re-registration decision to endangered Pacific Salmon in 2008. The NMFS concluded that the EPA re-registration of malathion would jeopardize the existence of 27 endangered populations

and adversely modify critical habitat for 25 endangered Pacific salmonids. The EPA is required to develop endangered species bulletins at the county level, or include FIFRA label requirements for California, Idaho, Oregon, and Washington. The county-level bulletins must address the following information.

- Where ground applications are permitted.
- Where aerial applications are permitted.
- Wind speeds during application are to be less than 10 mph.
- Agricultural uses will have a minimum of 20 feet of non-crop vegetation on the downhill side of the application areas immediately adjacent to any surface water that have a connection to salmonid-bearing waters.
- Do not apply products when soil moisture is at field capacity or when a weather event is likely to produce run-off from the application site within 48 hours of application.
- Report all incidents of fish mortality that occur within 4 days of application and within the vicinity of the application area. More information about the NMFS biological opinion may be found at the following links, and a search for “pesticide” may be done at the last link.

<https://www.fisheries.noaa.gov/national/endangered-species-conservation/biological-opinions#biological-opinions-available-online>

<https://repository.library.noaa.gov/view/noaa/14798>

<https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts>

However, the use of malathion for public health purposes is exempt from the label or bulletin requirements related to the biological opinion.

Malathion use as a larvicide is restricted under Ecology’s Draft Aquatic Mosquito Control NPDES General Permit. Malathion may only be used for the control of mosquito larvae with Ecology approval after consultation between Ecology, the DOH, and the WDFW in response to a public health emergency or pesticide resistance in a mosquito population. This limits the amount and number of times that malathion may be discharged to surface waters.

Methoprene

Methoprene is a compound that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae. Unable to metamorphose, the mosquitoes die in the pupal stage. Methoprene is classified as a biochemical pesticide because it controls mosquito larvae by interfering with the insect’s life cycle rather than through direct toxicity.

Methoprene is available in numerous formulations and sold under the product names: Zoecon Altosid, Biosid, and Strike. Formulations labeled for residential use are sold under the names Pre-Strike and Vet-Kem.

Studies indicate that methoprene has a low toxicity and poses little risk to people when used according to label instructions. Methoprene was not shown to have any significant toxicological effects in the standard battery of toxicity studies used to assess human health effects. The pesticide has very low acute oral and inhalation toxicity potential and is not an eye or skin irritant. Methoprene also has a low acute dermal (skin) toxicity and is not a human skin sensitizer.

In laboratory tests, the toxicity of methoprene to birds and fish is low, and it is nontoxic to bees. Field studies involving methoprene have shown that it has no lasting adverse effects on populations of

invertebrates or other non-target aquatic organisms when used according to label instructions for mosquito control.

Methoprene mosquito control products present minimal acute and chronic risk to freshwater fish, freshwater invertebrates, and estuarine species. Methoprene is not persistent in the environment. It degrades rapidly in water, being susceptible to transformation by sunlight and microorganisms.

Monomolecular Surface Films

Monomolecular surface film (MMSF) is a non-petroleum surface oil that acts as a physicochemical agent by altering the mosquito's habitat. It belongs to the alcohol ethoxylate group of surfactants—products meant to increase product efficacy—which are used in detergent products. MMSFs disrupt the cohesive properties of water, which allow mosquitoes to use the water's surface as an interface for breeding. In effect, by making the surface "wetter," MMSFs drown mosquitoes.

MMSFs kill larvae and pupae by making it impossible for them to keep their breathing tubes above the water's surface. Mosquitoes that require little or no surface contact for breathing, such as *Coquillettidia* species, require properly timed applications at surface contacting stages—the pupae to emerging adult—for maximum impact. Since MMSFs kill mosquitoes with a physical mechanism (rather than a toxic mechanism), it is not effective in habitats with persistent winds of greater than ten miles per hour, or in areas with very choppy water.

Some species, such as the midge, and some arthropods that require attachment to the water surface, have been shown to be affected. MMSF is non-toxic to most non-target wildlife. After being exposed to a constant film presence for six months, the green tree frog progressed normally from tadpole to adult through several generations. According to the EPA, MMSFs pose minimal risks to the environment when used according to directions on the FIFRA label.

MMSFs are not a skin irritant. They are only a mild eye irritant with prolonged or repeated contact and they are considered to be non-toxic according to animal tests. As with all pesticides, direct contact should be avoided. The film persistence is dependent on temperature, water flow, the amount of bacteria in the water, and the duration and strength of the wind following application. MMSFs typically persist on the water's surface for 5 to 22 days.

Spinosad

Spinosad consists of two chemicals—spinosyn A and spinosyn D—and is derived from a naturally occurring soil-borne bacterium. Spinosad has been registered for use as a pesticide by the EPA since 1997.

Spinosad has a low toxicity to humans and other mammals and is not likely to cause cancer. Spinosad was also not shown to be mutagenic. The EPA classifies spinosad as a reduced risk pesticide.

Spinosad has a half-life in water of less than one day and breaks down rapidly in the presence of sunlight. It binds rapidly to sediment and has a low potential to move through the soil and into groundwater. Spinosad is:

- Practically non-toxic to moderately toxic to fish.
- Slightly toxic to moderately toxic to aquatic invertebrates.
- Practically non-toxic to slightly toxic to birds tested.

Spinosad is highly toxic to bees, but once the spinosad product has dried, there is little to no effect on bees. However, the Aquatic Mosquito Control NPDES General Permit regulates applications of spinosad to water to control larvae, therefore, it is unlikely that bees will be impacted by its use.

Spinosad is not toxic to plants when used as directed by the FIFRA label.

Temephos

Temephos is a broad spectrum, non-systemic organophosphate insecticide. It is registered for use only as a mosquito larvicide. It is a hydrophobic chemical but does bioaccumulate. Nearly 75% of temephos that is bioaccumulated is eliminated over time with no exposure.

Temephos is not very persistent in water, but binds tightly to soils and sediments. However, temephos' degraded products do not bind tightly to soils, which could lead to continued suspension or re-suspension in water. The half-life of temephos in soil is estimated to be 30 days.

Like other organophosphates, temephos works by disrupting the central nervous system through cholinesterase inhibition. It has a lower toxicity to mammals, but in chronic exposure studies, cholinesterase inhibition and reduced liver weights were noted. Testing with rats found that while some temephos remained in the body, most of it was eliminated unchanged through feces and urine.

Depending on the product formulation, temephos is moderately to very highly toxic to beneficial insects and aquatic organisms (both vertebrates and invertebrates) during acute and chronic testing. It is also moderately to highly toxic to some species of birds.

Temephos use as a larvicide is restricted under the Draft Aquatic Mosquito Control NPDES General Permit, and is not permitted for use as an adulticide. Temephos may only be used to control mosquito larvae in:

- Non-potable, highly polluted water.
- Water with a high organic content (such as sewage lagoons, manure lagoons, or pastures, all of which must have no surface water run-off).
- Response to pesticide resistance development within a specific population of mosquitoes.

Ecology must approve the use of temephos after consultation between Ecology and the WDFW, in response to a public health emergency or pesticide resistance. This limits the amount and number of times that temephos may be discharged to surface waters.

ADULTICIDES

The Draft Aquatic Mosquito Control NPDES General Permit authorizes the incidental discharge of several adulticidal active ingredients when an entity is working to control mosquitoes. The active ingredients included for use in the draft general permit include the following. Information about these adulticides is included below as well as in the Fact Sheet for the Draft Aquatic Mosquito Control NPDES General Permit.

- Deltamethrin (see "pyrethrins and pyrethroids" below)
- Etofenprox (see "pyrethrins and pyrethroids" below)
- Malathion (see "malathion" in the larvicide section above)
- Naled
- Natural pyrethrins (see "pyrethrins and pyrethroids" below)

- Permethrin (see “pyrethrins and pyrethroids” below)
- Piperonyl butoxide (PBO)
- Prallethrin (see “pyrethrins and pyrethroids” below)
- Resmethrin (see “pyrethrins and pyrethroids” below)
- Sumithrin (d-phenothrin) (see “pyrethrins and pyrethroids” below)

Naled

Naled is a broad spectrum, non-systemic organophosphate insecticide. It is registered for use as a mosquito adulticide. Naled has one metabolite—dichlorvos (DDVP)—that is also an organophosphate pesticide registered with the EPA.

Like other organophosphates, Naled works by disrupting the central nervous system through cholinesterase inhibition. Naled is:

- Moderately to highly toxic to birds.
- Highly toxic to non-target insects (such as honeybees).
- Moderately to very highly toxic to aquatic organisms.
- Moderately toxic to mammals on an acute basis, with some chronic effects.

Naled, use as an adulticide, is restricted under the Draft Aquatic Mosquito Control NPDES General Permit. It is not permitted for use as a larvicide. Naled may only be used for control of adult mosquitoes in accordance with the permittee’s Integrated Pest Management (IPM) plan.

Piperonyl Butoxide (PBO)

Piperonyl butoxide is a chemical that is added to many pesticide formulations. It increases the effect of pyrethrins and pyrethroids by acting as a synergist. PBO increases the insecticidal properties by reducing the effectiveness of the detoxification enzyme that works to eliminate pyrethroids from an insect’s system. This reduces the dose of pyrethroids necessary to cause mortality in mosquitoes, other insects, and some small mammals (rats, mice).

PBO is only slightly toxic to humans and other larger mammals. However, some transient enzyme inhibition has been observed. The target organ in mammals is the liver, and chronic exposure can lead to increases in liver weight. PBO also has a low to very low toxicity to birds.

As a single chemical test, PBO is moderately toxic to aquatic organisms. Acute testing of freshwater fish and invertebrates resulted in a LC50’s of 1.9 and 0.51ppm, respectively. No-observed-adverse-effect levels have also been estimated for PBO at 0.04ppm for freshwater fish and 0.03 for freshwater invertebrates.

PBO is always in as a synergist for a primary active ingredient, and is not used as a single active ingredient as an adulticide or insecticide.

Pyrethrins and Pyrethroids

The Draft Aquatic Mosquito Control NPDES General Permit includes the following pyrethrins and pyrethroids to control mosquitoes. This section provides a general overview of the pyrethrin and pyrethroid group, as well as a brief description about each of the specific adulticides in the group.

- Deltamethrin

- Etofenprox
- Natural pyrethrins
- Permethrin
- Prallethrin
- Resmethrin
- Sumithrin (d-phenothrin)

Natural Pyrethrins are compounds isolated from the chrysanthemum flower (*Chrysanthemum cinerariaefolium*) with insecticidal properties. A number of synthetic derivatives have been created from pyrethrins and are referred to as “pyrethroids.” Pyrethroids are more UV stable—resist UV degradation—and cost effective to produce.

As a group, pyrethrins and pyrethroids mostly have a similar mode of action. These chemicals interfere with the sodium channels in nerve cells that serve as part of the nervous system communication system. However, it is unknown if all pyrethroids alter the same sodium channels.

Pyrethroids have a very low toxicity to humans and other larger mammals. The EPA lists pyrethroid compounds as class 3 or 4, depending on the exposure route for acute testing. Class 3 pesticides are rated slightly toxic by the EPA, while class 4 pesticides are practically non-toxic.

Pyrethroids are toxic to beneficial insects such as butterflies, moths, and bees. Insects of similar size, such as midges, may see an increase in mortality after pesticide application. Larger insects may also be affected. LD50 mortality is seen in *Apis Mellifera*—the domestic honeybee—at an average of 0.08 micrograms (μg) per bee. The EPA lists toxicity to bees from permethrin for dermal exposure at LD50 = 0.13 μg per bee and oral exposure at LD50 = 0.024 μg per bee.

The EPA lists pyrethroids as highly toxic to very highly toxic to aquatic organisms. Results from acute testing of active ingredients on freshwater fish range from LC50 of 0.28 to 5.1 ppb. Chronic toxicity with freshwater invertebrates lists results for No Observed Adverse Effect Concentration (NOAEC) at 0.039 to 0.86 ppb.

Pyrethroids have a high affinity to binding to soils, waterbody sediments, and suspended sediments. This high affinity to binding should greatly reduce the likelihood that pyrethroids will leach into groundwater.

A general description of the following pyrethrins and pyrethroids is included below.

- Deltamethrin

In its purest form, deltamethrin is made up of colorless or white to light beige crystals that have no odor. It is effective against mosquitoes via ingestion and direct contact, and is non-selective. Deltamethrin disrupts the mosquitoes’ normal nervous system function.

Deltamethrin is less toxic to mammals due to mammals’ higher body temperature, larger body size, and decreased sensitivity of the ion channel sites. However, it can be harmful if it is swallowed. After ingesting deltamethrin, humans may experience abdominal pain, convulsions, muscle twitching in hands and feet, headache, and delirium. Deltamethrin also causes moderate eye irritation and can cause reactions in some individuals when there is prolonged or frequent skin contact. The EPA classifies deltamethrin as not likely to be a human carcinogen.

Deltamethrin can also affect dogs and cats if they eat, breathe, or touch it. After ingesting deltamethrin, some dogs exhibited vomiting, hyperexcitability, stiffness in the hind legs, and

impaired body movement. However, laboratory animals that ingested deltamethrin while pregnant did not have offspring with birth defects.

Deltamethrin is moderately to highly toxic to fish under laboratory conditions. However, it is not expected to affect fish when used according to the FIFRA label because it binds tightly to soil and breaks down quickly.

Deltamethrin is extremely toxic to aquatic invertebrates. And, under laboratory conditions, it is highly toxic to bees. In field studies, deltamethrin did not harm bees at rates up to 12.5 g a.i./ha. Formulated products had a repellent effect that lasted up to 3 hrs. Deltamethrin had no effects on earthworms when the soil was treated with 12.5 g/ha, and it was practically non-toxic to birds when they ate it.

- Etofenprox

Etofenprox is a synthetic pyrethroid and its mode of action is similar to other pyrethroids. However, etofenprox differs in structure from other pyrethroids because it is an ether compound and pyrethroids are esters. According to the EPA, no available data suggests that etofenprox targets the sodium channel and that exposure to etofenprox does not result in the neurotoxic syndromes typical of pyrethroids.

Etofenprox is toxic to mosquitoes and is non-selective. Etofenprox is toxic to mammals if high doses are ingested. When ingested by mammals, etofenprox targets the liver, thyroid, kidney, and hematopoietic system. It has a low acute toxicity via the oral, dermal, and inhalation routes. It is not an acute eye or skin irritant, however it can cause skin irritation after repeated exposure. The EPA classifies etofenprox as not likely to be a human carcinogen.

Etofenprox is toxic to fish and aquatic invertebrates. It is highly toxic to bees and has a low toxicity to birds. It degrades rapidly when exposed to UV and is decomposed in the soil by anaerobic and aerobic microorganisms.

- Natural pyrethrins

See the general description for “natural pyrethrins”, included above.

- Permethrin

Permethrin affects mosquitoes via ingestion and direct contact, and is non-selective. It affects their nervous system, causing muscle spasms, paralysis, and death. Permethrin is more toxic to insects than to mammals, such as humans and dogs, because insects can't break down permethrin as quickly as mammals.

Humans exposed to permethrin via direct contact on their skin may experience irritation, tingling, and possibly burning at the contact site. It can also cause redness, pain, and burning if it enters the eyes. If ingested or inhaled, permethrin can cause irritation to the respiratory system, abdominal pain, nausea, vomiting, headaches, and dizziness.

Permethrin is highly toxic to fish and aquatic invertebrates, both in fresh water and salt water environments. It is highly toxic to honeybees and other beneficial insects, but has a low toxicity to birds.

- Prallethrin

Prallethrin is a synthetic pyrethroid and its mode of action is characteristic of other pyrethroids. Prallethrin is toxic to mosquitoes and is non-selective. It stimulates the nervous system and blocks nerve impulse transmissions. This eventually causes paralysis and death.

Prallethrin has a low toxicity to mammals with no evidence of carcinogenicity. It can be moderately toxic when ingested or inhaled. Chronic studies conducted on rats ingesting prallethrin for 21 days

resulted in tremors, sensitivity to external stimuli, twitching, and writhing spasms. Prolonged exposure to prallethrin revealed slight toxic effects mainly in the liver, kidney, and thyroid. It has a low toxicity via the dermal route, is a non-irritant to skin, and a minimal irritant to the eyes. The EPA classifies prallethrin as not likely to be a human carcinogen.

Prallethrin is very toxic to fish and aquatic invertebrates. It is very toxic to bees and has a low toxicity to birds. Prallethrin is a yellow to yellowish-brown liquid that is practically insoluble in water. It photolyzes when exposed to sunlight, binds tightly to sediment suspended in the water column, and has low mobility in soil.

- Resmethrin

Resmethrin kills mosquitoes via direct contact and is non-selective. It interferes with the normal function of their nervous system. It is more toxic to insects than mammals because insects have a lower body temperature.

Resmethrin has a low toxicity to humans, regardless of the route of exposure. Dermal contact may result in stinging, burning, and numbness. Inhaling resmethrin may cause dizziness, nausea, and fatigue.

Resmethrin is primarily broken down by UV and has a half-life of 30 days. It binds tightly to soil and does not mix well with water, which make it unlikely to enter groundwater.

Resmethrin is very highly toxic to fish and aquatic invertebrates, in both fresh water and marine water environments. However, because it doesn't mix well in water, binds tightly to soil, and breaks down in UV, the effects of resmethrin on fish and aquatic invertebrates is reduced. Resmethrin is also highly toxic to bees, but has a low to moderate toxicity to birds.

- Sumithrin (d-phenothrin)

Sumithrin kills mosquitoes via direct contact and is non-selective. It disrupts the transmission of nerve impulses by stimulating the nerve cells and eventually causing paralysis. Sumithrin would similarly impact the nervous system in mammals, except that mammalian nervous systems are less sensitive and recover more quickly. Mammals also have a higher body temperature, which reduces the effect of sumithrin.

When high doses of sumithrin are ingested by mammals, their liver and kidneys may be damaged. Cats and dogs are particularly susceptible to the impacts of sumithrin, when ingested. Other mammalian symptoms of exposure include dizziness, headache, fatigue, and diarrhea.

Sumithrin is very toxic to fish and aquatic invertebrates. It is also highly toxic to bees.

DISEASE TRANSMISSION BY MOSQUITOES

Mosquitoes are disease vectors for illnesses that impact animal and human health. Treatments conducted under the Draft Aquatic Mosquito Control NPDES General Permit are expected to reduce mosquitoes' role in vectoring diseases to other animals. The discussion on human health and disease, included below, is from the Fact Sheet for the Draft Aquatic Mosquito Control NPDES General Permit.

Female mosquitoes of nearly all species require a blood meal (for protein) from vertebrate animals to develop eggs. Several species of mosquito will use humans as blood meal hosts and some of these species can transmit various diseases to humans.

In order for a mosquito to transmit disease to humans, it must first take a blood meal from a host that is carrying a transmittable disease. Most of these hosts are birds and small mammals, making them important to the amplification of diseases in the environment. After taking a blood meal from an infected

bird or animal, the mosquito may bite a human, transferring the disease to the human in its saliva. West Nile Virus (WNV) is a good example of this mode of transmission.

Diseases transmitted by mosquitoes and other insects are known as arthropod-borne viruses (arboviral diseases). Globally, the diseases transmitted by mosquitoes to humans include West Nile virus, encephalitides, dengue, yellow fever, malaria, and filariasis. Other pathogens transmitted by mosquitoes include *Dirofilaria immitis*, a parasitic roundworm and the causative agent of dog heartworm. Some of these diseases have been endemic or epidemic diseases in the United States in the past. But today, the arbovirals usually reported are encephalitides and West Nile Virus. Dengue occurs periodically in this country, but mostly in the far South.

PUBLIC HEALTH IMPACTS FROM MOSQUITOES

Currently, only WNV, St. Louis Encephalitis (SLE), and Western Equine Encephalitis (WEE) are known to occur (endemic) in Washington, according to DOH comments on the preliminary draft of the 2015 general permit. These diseases can cause serious, sometimes fatal, neurological ailments in people (the WEE virus also causes disease in horses). WEE infections tend to be more serious in infants while SLE can be more serious in the elderly. The WNV can infect anyone, though immunocompromised people or those over 50 have the highest probability of developing a severe form of the disease. These viruses normally infect birds and small mammals in the environment. During such infections, the level of the virus may increase in these infected animals (amplification) facilitating transmission to humans by mosquitoes.

The WNV, a much publicized arboviral disease in Washington and the U.S, was originally found in the northeastern United States in 1999. Approximately 20 percent of the humans infected with the WNV will develop West Nile Fever, which has symptoms similar to influenza, and lasts for a few days to several weeks in rare cases. Of those infected with the WNV (not West Nile Fever), approximately 0.7% will develop a severe form of the WNV neuroinvasive disease. The neuroinvasive form of the WNV can be meningitis, encephalitis, meningoencephalitis, or poliomyelitis and can leave lasting neurological effects after recovery. Most humans infected with WNV will never develop symptoms.

Close to 30,000 human cases of West Nile Virus have been reported in the U.S. as of the end of 2009. Of those cases, 12,088 were reported as meningitis/encephalitis, 16,765 were West Nile fever, and 771 were unspecified reports. 1161 mortalities due to the neuroinvasive form of WNV have been reported separately.

In Washington, the first reports of WNV occurred in 2006. Since then, 42 human cases of WNV have been reported, three of which were meningitis/encephalitis. One death occurred due to the neuroinvasive form of WNV in 2009. In 2014, a total of 13 human cases of WNV were reported, with two being acquired out of state.

(<http://www.doh.wa.gov/DataandStatisticalReports/DiseasesandChronicConditions/WestNileVirus>)

Even if mosquitoes do not transmit disease when they bite, mosquito bites can cause other effects such as irritation, redness, itching, pain, secondary infections, and allergic reactions. Though Ecology found no statistics for allergies to mosquito bites, an article in the Journal of Allergy and Clinical Immunology by the Joint Council of Allergy Asthma and Immunology lists life threatening stinging insect (bees, wasps, and ants) allergies as affecting 0.4-0.8% of children and 3% of adults. An assumption that mosquito allergies occur with similar frequency is possible.

2b. Proposed measures to protect or conserve plants, animals, fish, or marine life include the following.

The permittee must ensure that the application of larvicides or adulticides does not cause or contribute to further impairment of waters of the state for any parameter for which a water body is listed as impaired.

Permittees must develop a SEPA checklist that is specific to the project. Project-level SEPA checklists will identify potential impacts that may result from the application of insecticides to control mosquitoes.

Permittees who plan to use adulticides to manage mosquito populations must complete an Integrated Pest Management (IPM) plan to address planning and controls around the discharge of adulticides. Permittees who only apply larvicides may use the Ecology publication “Best Management Practices for Mosquito Control, May 2004 (publication number 03-10-023), or equivalent, in place of developing their own IPM plan. If the permittee later decides to include adulticides in their mosquito control operations, they must develop an IPM plan prior to using adulticides.

LARVICIDES

The permittee may apply larvicides if one or more of the following conditions are met:

- Pretreatment surveillance of a mosquito breeding site indicates that at least one larvae/pupae is present in at least one of three dips. In the event that the permittee finds larvae/pupae, and the area is treated, the permittee may continue pre-emptive larvicide treatments without dipping for the remainder of the treatment season.
- Methoprene, Bacillus sphaericus, and Bti-based larvicides may be used as a pre-emergent dry-land treatment without dipping in areas that have a historical record of mosquito hatches following flooding.
- The application site is in, or adjacent to, a county in which mosquitoes test positive for disease, or bird, animal, or human mosquito-borne disease cases are confirmed during the current treatment season.
- The treatment site is a catch basin, storm drain, and utility or transportation vault.
- State or local health authorities declare a public health threat or emergency related to mosquito-borne disease.

The permittee may not apply temephos or malathion in lakes, streams, the littoral zone of water bodies, or the sites referenced in Special Condition S4.B.6. Use of malathion and temephos is only allowed in response to the development of pesticide resistance within a specific larval mosquito population and with the approval of Ecology, after consultation with the Washington State Department of Fish and Wildlife (WDFW).

ADULTICIDES

The permittee must comply with the following conditions when applying adulticides.

- Applications of adulticides may only indirectly enter the water and not be applied directly to water.
- The permittee must use ultra-low volume (ULV) application equipment to apply adulticides if available. If ULV equipment is not available, the permittee may use other FIFRA label-approved application techniques.
- The use of malathion and naled as an adulticide shall be done in accordance with the permittee’s IPM plan. These chemicals may not be used in the vulnerable species areas referenced in special condition S4.B.6.

VULNERABLE SPECIES

The permittee must ensure that application of larvicides or adulticides does not cause permanent harm to vulnerable (sensitive, threatened, or endangered) species populations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable (Endangered, Threatened, or Sensitive) Species” (areas of concern).

For those areas identified in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable (Endangered, Threatened, or Sensitive) Species” that are within the permittee’s jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern in conjunction with the WDFW. The plan must be mutually acceptable and agreed to by both the permittee and the WDFW.

The plan must address how mosquitoes will be managed in the area of concern, including the timing of application; the larvicides and adulticides used; and how impacts to the sensitive, threatened, or endangered species will be minimized or eliminated.

Until the plan is completed and agreed to by both parties, the permittee is limited to the use of *Bacillus sphaericus* and Bti-based larvicides

The plan agreed to by the permittee and the WDFW must be made available to Ecology and the public upon request.

The WDFW may periodically update the information contained in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable (Endangered, Threatened, or Sensitive) Species” when new information becomes available.

3a. How would the project (*proposal*) be likely to deplete energy or natural resources?

Ecology does not anticipate discharges conducted under this permit to deplete energy or natural resources. Treatments conducted under this permit may temporarily impose water use restrictions for entities with surface water withdrawal rights. However, the quantity of water available to water rights holders will not be impacted.

3b. Proposed measures to protect or conserve energy and natural resources include the following.

Not applicable.

4a. How would the project (*proposal*) be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Discharges conducted under this permit may occur in areas where sensitive, threatened, or endangered species occur. Impacts from treatments could include direct toxic effects or secondary effects on food supply.

4b. Proposed measures to protect such resources or to avoid or reduce impacts include the following.

The permittee must ensure that application of larvicides or adulticides does not cause harm to vulnerable (sensitive, threatened, or endangered) species populations, which is regulated under the endangered species regulations.

The WDFW identified specific areas which are known habitat for vulnerable species. These areas are listed in the document titled “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species”. The document was created in 2002, revised in 2015, and can be found via the following link.

<https://ecology.wa.gov/DOE/files/3e/3e837bdb-10d0-4496-9b51-40a0f053f53f.pdf>

For those areas identified in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” that are within the permittee’s jurisdiction, the permittee must develop a plan for the management of mosquitoes within the area of concern and submit the plan for review and approval by Ecology. The plan must include letters of concurrence from the WDFW and the affected land management agency, if one exists.

The plan must address how mosquitoes will be managed in the area of concern, including the timing of application; the larvicides and adulticides used; and how impacts to the sensitive, threatened, or endangered species will be minimized or eliminated.

Until the plan is completed and approved by Ecology, the permittee is limited to the use of *Bacillus sphaericus* and Bti-based larvicides

The WDFW may periodically update the information contained in “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable (Endangered, Threatened, or Sensitive) Species” when new information becomes available.

5a. How would the project (*proposal*) be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

During treatments conducted under the permit, there may be restricted access to the lands and shorelines where application occurs. The duration of the restricted access should be temporary and short lived. After the temporary restriction to land and shoreline use is lifted; land and shoreline use may be enhanced by the management of mosquito populations, including an increased use of the land and shoreline.

5b. Proposed measures to avoid or reduce shoreline and land use impacts include the following.

PUBLIC NOTICE

The permittee must publish a public notice on their webpage or in a newspaper with general circulation within the area where larvicide or adulticide application will take place at least ten (10) days before the first pesticide application of the season.

State agencies with statewide permit coverage (e.g. WSDOT), may publish a public notice in one major newspaper of general circulation for each agency region (e.g. WSDOT Olympic Region, North Central Region, etc.) where the mosquito control activity will take place.

This notice must include:

- a. The pesticide(s) planned for use and the active ingredient(s).
- b. The approximate date ranges of planned treatments.

- c. The approximate treatment location(s).
- d. The online location where the public may find pesticide application updates (if available online).
- e. The application area posting procedures if the use of larvicides with water-use restrictions is planned.
- f. The name and telephone number of the permittee and the Ecology Aquatic Pesticides Permit Manager.
- g. The telephone number, email address or web site where a person may contact the permittee to have their name put on a “No Spray” list.

The permittee’s notification to the public regarding mosquito control activities must continue throughout the treatment season if applications occur. After the initial newspaper notice, the permittee may notify the public using a method other than notices in the newspaper, such as web site postings, mailings, or radio spots.

The permittee must notify wildlife refuges 24 hours in advance of aerial application of adulticides or larvicides over the refuge.

POSTING REQUIREMENTS

1. The permittee must post notices at all reasonable points of public access to the treatment areas when applying larvicides with water-use restrictions to water bodies used for water supply, fish and shellfish harvesting, swimming, or other water contact activities.
2. The permittee need not post notices at sites that are not publically accessible (e.g. catch basins, storm drains, utility and transportation vaults, etc.).
3. The permittee must make maps available, to the public, of the adulticide application areas. Maps posted on web pages or available hard copies meet this requirement.

6a. How would the project (*proposal*) be likely to increase demands on transportation or public services and utilities?

Ecology does not anticipate an increase in demands on transportation or public services. The majority of permittees that obtained coverage under previous issuances of this permit were public entities conducting mosquito control activities. Treatments conducted under the Draft Aquatic Mosquito Control NPDES General Permit may have the effect of reducing mosquito-borne illness, which could reduce the burden on public health entities and veterinary health entities.

6b. Proposed measures to reduce or respond to such demand(s) include the following.

The Draft Aquatic Mosquito Control NPDES General Permit does not include measures to reduce demands on transportation, public services, or utilities.

7a. Identify, if possible, whether the project (*proposal*) may conflict with local, state, or federal laws or requirements for the protection of the environment.

ESA-listed and state-listed endangered, threatened or sensitive species have the potential to be impacted under this permit. Ecology feels that if permittees follow the conditions in this permit, the FIFRA label, the Washington Pesticide Control act and the Washington Pesticide Application Act that impacts to ESA-listed and state-listed species can be avoided.